

## Thirsty Orchard Captures Water with Cover Crops

Consider two orchards standing sideby-side after three rainy spring days. One orchard is flooded with its bare trees ankle-deep in standing water. The other orchard hosts a lush stand of green grass, vetch and clover instead of standing water. Rain that fell on this orchard has percolated into the root zone, through the dark, crumbly soil profile. There the water will remain when the soon-to-come summer heat will bake this orchard in temperatures of 90-100 degrees. As surface water deliveries in many areas of California are cut to nothing, or near nothing, due to drought, harvesting water from the soil profile, may closely correlate, with harvesting a crop.



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Russ Lester of Dixon Ridge Farms in Solano County, Calif. owns the orchard with the green carpet of cover crops. This orchard is part of his organic walnut operation in Solano and Yolo Counties, California. From its micro-irrigation system suspended in the trees (emitters protected) to its on-site walnut processing plant fueled by biogas from the walnut shells, Dixon Ridge Farms is a sort of gallery of innovative

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practices, all with carefully considered benefits for both production and the environment. Cover crops have an important place in Lester's list of progressive approaches.

"For me cover crops are really key to capturing water," says Lester. "Of course they have a lot of other benefits," he says counting the benefits with his fingers: "Fertility from the legumes, hosting pollinators, attracting beneficial insects, discouraging weeds, retaining moisture that would otherwise evaporate—but for water capture reasons alone the cover crops would be worthwhile."

Without the thick mat of plants and the crumbly porous soil created by the cover crops, raindrops hit the bare soil of an orchard floor with an impact that can seal the soil surface. The result is standing water and ultimately run off, sending precious water down the ditch along with equally precious topsoil. Hitchhiking fertilizers or insecticides attached to soil particles cause both an economic loss for the farmer and a water quality concern for the community.

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Every 1% increase in organic matter results in as much as 25,000 gallons of available soil water per acre.

Lester used to take a very casual approach to cover crops. "We just worked with whatever came up naturally," he said. He switched to a more targeted mix of cover crop species in 1989, adopting a high biomass mix that came from research by BIOS (Biologically Integrated Orchard Systems). In 2006 Lester began working with USDA's Natural Resources Conservation Service on cover crops and other conservation enhancements. The flowering plants in the cover crop enhance pollination and provide nectar for the beneficial insects that fight walnut pests like coddling moth and walnut husk fly. More generally the high biomass mix builds soil organic



An orchard without cover crops after heavy rain.

matter, and once-mowed in early summer, creates a thick mat that holds moisture in and keeps weeds down.

Critics counter that cover crops steal water that is desperately needed by the cash crop.

"Not really," says Lester. "The cover crops are growing and using water in the winter when the walnuts are dormant," he says. "By the time the walnuts need water, we are mowing the cover crop down." Additionally, the mowed mat conserves moisture on the orchard floor and the cover crops are vital agents in capturing winter rainfall in the soil profile and in the groundwater. "I consider myself a conservationist, sure, but I'm also a businessman. Cover crops are a good conservation practice and they are also good business," Lester says definitively. "They are a key part of the way we do things at Dixon Ridge Farms and I would definitely recommend them to California farmers concerned about capturing and keeping all the water they can on their own property."

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